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EPA Superfund Actions and ATSDR Public Health Data

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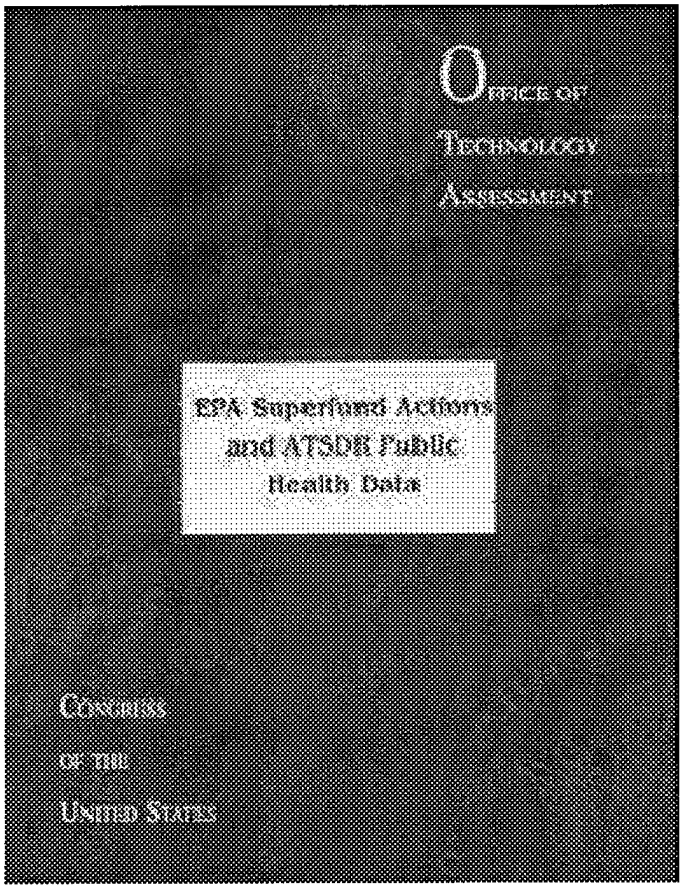


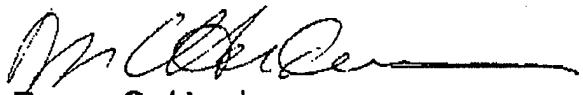
Foreword

The Superfund program, authorized by Congress 15 years ago, was intended to address the clean up of U.S. hazardous waste sites. Implicit in the Superfund program is the idea that human health concerns are a key factor in establishing in clean up criteria for abandoned or orphaned hazardous waste sites. However, the Superfund program as administered by the U.S. Environmental Protection Agency (EPA) has come under increasing criticism from various quarters as not focusing on actual human health concerns related to possible exposure to chemical wastes. The House Committee on Commerce, Subcommittee on Commerce, Trade and Hazardous Materials, asked the Office of Technology to examine how EPA has set cleanup priorities in response to Superfund site health ranking data provided by the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services (ATSDR). The Subcommittee also asked OTA to examine how EPA has responded to completed exposure pathways identified by ATSDR for certain Superfund sites.

This background paper discusses how EPA sets Superfund cleanup priorities based on Superfund site health ranking data provided by ATSDR. It examines several parameters by which EPA site prioritization might be measured, including timeliness, cost, and use of special removal actions at the worst sites.

OTA found that EPA prioritizes cleanup of Superfund sites based on many other factors in addition to current public health risks. EPA must also take into account future potential health risks, as well as several other factors. Therefore, cleanup prioritization often do not correspond with ATSDR's public health rankings. Nevertheless, removal actions to address pressing health concerns are more frequent at higher hazard sites, and more money is spent in cleanup at these sites. Thus despite the fact that public health risk is only one criteria among many by which EPA sets cleanup priorities, there is no evidence that EPA is giving a lower priority to cleaning up the worst sites.

OTA appreciates the assistance and support it received for this effort from many contributors and reviewers, including EPA and ATSDR. They provided OTA with valuable information critical to the completion of this background paper and important insights about its technical evaluations and projections. OTA, however, remains solely responsible for the contents of this report.



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Note: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the reviewers The reviewers do not, however, necessarily approve, disapprove, or endorse this background paper. OTA assumes full responsibility for the background paper and the accuracy of its contents.

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Introduction and Summary

This background paper is in response to a letter dated May 3, 1995, from Representative Michael Oxley, Chairman of the Subcommittee on Commerce, Trade and Hazardous Materials, Committee on Commerce. That letter requested that the U.S. Congressional Office of Technology Assessment (OTA) prepare a memorandum for a hearing held by the Subcommittee in May 1995 on the reauthorization of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund. OTA provided the Subcommittee a draft of this report for the hearing. This background paper is the final version of the report.

The Subcommittee's request letter asked OTA to determine if, or to what extent, the U.S. Environmental Protection Agency (EPA) has used available information about impacts on public health to set its priorities and to select sites for cleanup from among the approximately 1,300 sites on the National Priorities List (NPL) Superfund sites. Specifically, the Subcommittee asked OTA to examine how EPA has responded to the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services (ATSDR) public health categories in setting cleanup priorities for NPL sites. The Subcommittee also asked OTA to examine how EPA has responded to cases where ATSDR has determined that a completed exposure pathway exists.[1]

As outlined in the request letter, one source of public health information about Superfund sites is ATSDR. ATSDR produces Public Health Assessments (PHAs) that categorize NPL Superfund sites according to their public health impacts. They categorized 230 sites in FY92 and 132 sites in FY93-94 (including 18 non NPL sites) into five categories of public health impact, called Public Health Categories (PHCs). These five categories are: 1. Urgent hazard, 2. Health hazard, 3. Indeterminant hazard, 4. No apparent hazard, and 5. No hazard. In this letter, OTA reports on our efforts to determine the extent to which EPA cleanup efforts correspond with these Public Health Category numbers provided by ATSDR.

To respond to this request, OTA conducted interviews with ATSDR and EPA staff, reviewed selected EPA Records of Decision (RODS, described below) and ATSDR Public Health Assessments, and analyzed data about cleanup activities provided by both EPA and ATSDR. Methods and sites selected for review are detailed in appendix B. The short time period for conducting this study limits evaluation of EPA's priority setting, but we offer the conclusions presented below.

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[1]This question was not separately addressed for the following reason. A completed exposure pathway means that a site has been found by ATSDR to have demonstrable and current human exposure to specific contaminants released from that site. OTA determined that the ATSDR public health category for a specific site depends a great deal on whether a completed exposure pathway is found that involves a contaminant that is both hazardous and present at levels of human health concern. Such a completed exposure pathway is required for ATSDR to give a site its highest public health category.

OTA Findings

OTA finds that in general there is good correspondence between the EPA's evaluation of current exposure and risk, as recorded in the Record of Decision (ROD), and the findings in the ATSDR Public Health Assessment (PHA) for the same site. However, EPA's NPL site cleanup decisions do not always correlate well with ATSDR's public health categorization. That conclusion is not unexpected, because EPA is charged by law with making site cleanup decisions based on a variety of factors in addition to the degree of public health threat posed. Nevertheless, OTA finds no evidence that EPA has given low priority to sites that ATSDR considers to be of the greatest public health concern.

EPA's Statutory Requirements

Statutory requirements for ATSDR and EPA are significantly different. The statutes that define ATSDR's authority, CERCLA and SARA*, clearly direct ATSDR to undertake actions related specifically to public health. ATSDR considers that they are required to focus almost exclusively on current public health threats to existing human populations and give little emphasis to potential risks for future populations.

EPA, on the other hand, interprets the relevant statutes as requiring them to:

a. consider both current and future potential health threats;

b. consider environmental impacts, in addition to human health effects;

c. meet Applicable or Relevant and Appropriate Requirements (ARARs), i.e., all federal and state laws that might apply to achieving cleanups[3];

d. find and negotiate with potential responsible parties (PRPs), a process which may limit EPA's flexibility in controlling the pace of cleanup;

e. consider cost-effectiveness, which may favor early cleanup before contamination spreads;

f. give strong each of these factors for a specific site is summarized in the Record of Decision (ROD). However, the ROD focuses only upon the site for which it was written, and makes no comp preference to permanent cleanup remedies;

g. consider State concerns and priorities (in some cases concurrence is required); and

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[2]CERCLA or Superfund is the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. It was amended by the SARA, the Superfund Amendments and Reauthorization Act of 1986.

[3]ARAR means "Applicable or Relevant and Appropriate Requirements" or those state and federal laws that might be applicable to the cleanup decision. For example, drinking water standards for specific pollutants, could be applied to the cleanup decision at a given site.

h. consider community concerns.

Because EPA's mandate requires consideration of these other factors in selecting and implementing site cleanup remedies – while ATSDR focuses solely on current public health hazards – it should be anticipated that EPA's priorities will not strictly correspond with ATSDR's public health assessment categorizations. OTA found that there is often only a limited correspondence between the stated basis for EPA's cleanup decisions as outlined in the ROD[4] and ATSDR public health categories for a given Superfund site. This is particularly true for those sites given the lowest public health risk categories by ATSDR.[5] However, OTA found no instances where EPA evaluated the current public health risks for a given site as being low when ATSDR had rated them as being high (public health categories of 1 and 2).

A major difference between EPA and ATSDR analyses is how potential future risks or exposures are treated. As described above, ATSDR's public health assessment categories are based solely on the current risks posed at a site, while EPA considers that it must take into account both current and potential future risks. OTA found that in more than one-third of the RODS reviewed (14 out of 32 or 44%), future risks and exposure scenarios are the primary impetus for establishing cleanup strategies, while current risks were small or had already been addressed. In some cases, the RODS stated that there was no current risk or exposure. In those cases cleanup strategies were determined solely by future risk and exposure scenarios (or other considerations such as ARARs). The future risks can range from the inevitable to the speculative. These observations are consistent with earlier OTA analysis, "Coming Clean: Superfund Problems Can Be Solved," OTA-ITE-433, October 1989.

EPA's Communication with ATSDR

There are now a variety of formal and informal processes in place designed to assure collaboration between EPA and ATSDR. The good correspondence between EPA's evaluation of current exposure and risks (as shown in the site's ROD), and ATSDR's public health assessment categorization (as shown in the PHA) is because both agencies generally rely upon the same data - which was gathered by EPA during the Remedial Investigation (RI) phase of the Superfund process. This is the same site data that EPA uses to perform its own risk assessments and to make decisions about site cleanup goals and options. ATSDR only occasionally generates its own data.

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[4]The Record of Decision (ROD) is a document that describes and summarizes the basis for EPA's selection of a cleanup remedy at a specific Superfund site. EPA's consideration of each of the statutory requirements listed above is summarized in the ROD for a specific site However, the ROD focuses only on the site for which it was written, and makes no comparisons nor sets priorities relative to other Superfund sites.

[5]For example a site given a ATSDR public health category of 5 (their lowest rating equivalent to "No hazard") might nevertheless in EPA's corresponding ROD be found to require extensive cleanup actions for non public health based reasons.

Both ATSDR and EPA say that the Public Health Assessments (PHAs) produced by ATSDR today are made available in a timely fashion such that EPA can incorporate the findings into their decision making process.[6] The two agencies also state that they communicate and coordinate well in a variety of ways in addition to the formal Public Health Assessments.

In addition to Public Health Assessments, when ATSDR discovers a particularly high public health risk at a specific site they can produce a Public Health Advisory. This has happened only 21 times, at both NPL and non NPL sites. Both ATSDR and EPA tell us that in cases where ATSDR has issued a Public Health Advisory that EPA has been quick to respond. Responses to the Public Health Advisory have included carrying out Removal Actions[7] or other activities to deal with the immediate public health threat. OTA has not independently confirmed all of these statements.

Numerical Analyses of EPA Priority Setting

OTA was asked to provide a numerical analysis of how well EPA's Superfund site cleanup priorities correspond to ATSDR's public health categorization. Tables showing the results of numerical analyses appear in appendix A. Since there is no obvious single quantitative measure of EPA's cleanup priorities, OTA looked at a number of measures that may be meaningful indicators. The results give no clear picture of EPA's prioritization. A review of the dates of specific cleanup actions at Superfund sites and of the costs allocated to cleanup shows little indication that EPA's efforts are driven by current health risks. On the other hand, OTA finds no evidence that significant current health risks are being ignored.

The completion of the Record of Decision (ROD) for any site represents a major milestone in moving toward site cleanup. Therefore timeliness in completing a ROD provides some indication of EPA's priority setting in the allocation of effort. Considering all NPL Superfund sites reviewed by OTA,[8] those sites in the highest ATSDR Public Health Category (PHC) were least likely to have completed RODS. Only 11 percent of the highest public health risk (PHC 1) sites have completed RODS, compared to 78 percent of the lowest public health risk (PHC 5) sites (see Table 1). Although this result seems to support the view that EPA's efforts are poorly correlated to public health threats, a more complete analysis suggest that the result may be misleading.

Because completing a ROD takes time, the more recently a site is listed on the

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[6] ATSDR is required by law to complete PHAs for all Superfund sites.

[7] A Removal Action is an expedited response to an acute hazard identified at a site, and requires a "present endangerment" to be invoked. After a Removal Action is completed a site may still become a Superfund site

[8] The Superfund sites reviewed by OTA for this purpose is the set of 344 NPI sites for which ATSDR completed Public Health Assessments during fiscal years 1992 through 1994.

NPL, the less likely the ROD for that site has been completed. Closer examination shows that the highest ATSDR PHC sites tend to have been put on the NPL more recently. Thus 7 of 9 PHC 1 sites were listed after 1990, while 7 of 9 PHC 5 sites were listed prior to 1984. Because of the difference in starting dates the higher public health category sites are less likely to have RODS completed. In an attempt to avoid this bias, OTA narrowed its analysis to look at data from a set of sites proposed for NPL listing within a single, narrow time period, from 1988-1990 (NPL lists 7 through 9). This period was chosen to include the most recent NPL listings for which more than a trivial numbers of ROD's have been completed. For sites listed in this time period, OTA found that higher public health priority sites were more likely to have completed RODS than lower public health priority sites (Table 2).

OTA also considered the length of time it took to complete a ROD, from the date of EPA's Hazard Ranking System score (EPA's initial assessment of site risk) to completion. OTA found no consistent relationship between the time it takes to complete a ROD and the ATSDR public health category. Table 3 shows the average number of days for completion of the ROD for sites in each ATSDR public health category.[9] Similarly, no consistent correlation was found between the time it took EPA to complete the first significant on-site remediation activity[10] and the ATSDR public health category (Table 4).

OTA did find that EPA Removal Actions are more likely to have taken place on sites ATSDR categorized as presenting the highest public health concern (Table 5). This is significant because in many cases, EPA Removal Actions address the source of current exposure that is the trigger for ATSDR public health concern.

One other measure of EPA priority is the cost of the proposed cleanup as established in the ROD. This allocation of funds reflects EPA's implicit priority setting in allocating resources among sites. From a sample of 32 RODS reviewed, OTA found that costs of the cleanup proposed for sites with higher ATSDR public health categories are significantly greater than for sites with lower ATSDR public health categories. The median cleanup costs were $9 million for sites put into ATSDR category 1 or 2 and $4 million for sites put into in ATSDR category 4 or 5 (all costs adjusted for inflation to 1993 dollars). Further, for three of the lower public health category sites (4 and 5), EPA chose to take no cleanup action, citing the low degree of health concern.

Summary

In summary, OTA found that EPA prioritizes cleanup of Superfund sites based

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[9]The sample is from those sites on the ATSDR list for which RODS have been completed and for which the date of the Hazard Ranking System score could be determined. Only sites proposed for NPL listing prior to 1992 (NPL lists 12 and earlier) were included, because few sites listed later have RODS.

[10]We include in these activities Removal Actions or other remedial actions, as well as the remedial investigation, the feasibility study, and the record of decision (ROD) itself.

on many other factors in addition to current public health risks. EPA must also take into account future potential health risks, as well as several other factors. Therefore, cleanup prioritization for a given site often does not correspond with ATSDR's public health category for that site. Nevertheless, Removal Actions by EPA that address the most immediate public health concerns are more frequent at sites found by ATSDR to have the greatest public health risks, and more money is spent to cleanup those sites. Despite the fact that public health risk is only one criteria among many by which EPA sets cleanup priorities, there is no evidence that EPA is ignoring public health risk as a factor in establishing cleanup priorities at Superfund sites.

Appendix A -Tables Referred to in this Document

Table 1. Proportion of sites' that have completed RODS.

ATSDR Public Health Category	Number of sites	Number with RODS (as of Apr. 95)	Percent (%) of sites with RODS
1	9	1	11
2	145	94	65
3	125	90	72
4	56	48	86
5	9	7	78
Total	344	240	70%

*Sites with ATSDR Public Health Assessments completed from FY92 to FY94. Twenty five with PHAs that were non-NPL sites were excluded from the analysis.
Public health category was taken from original PHAs, rather than any later updates.

Table 2. Proportion of sites' proposed for NPL in lists 7 through 9 (1988 to 1990) that have completed RODS.

ATSDR Public Health Category	Number of sites	Percent (%) of sites with RODS (as of Apr. 95)
1	0	--
2	18	83
3	11	73
4	6	67
5	0	--
Total	35	77 0/0

*Sites proposed for NPL in lists 7-9 and with ATSDR Public Health Assessments completed from FY 1992 to FY 1994.

Table 3. Average number of days from completing the Hazard Ranking System (HRS) process to the completion of the ROD.[a]

ATSDR Public Health Category	Number of sites	Number of days to ROD
1	0	--
2	69	2,188
3	57	2,524
4	42	2,159
5	6	2,361
US Total	**174**	**2,297**

[a]Sites with any completed RODS and with ATSDR Public Health Assessments completed from FY92 to FY94 .

Table 4. Average number of days from completing the Hazard Ranking System (HRS) process to the completion of first cleanup related activity.[a]

ATSDR Public Health Category	Number of sites	Number of days to ROD
1	0	--
2	84	1,472
3	58	1,879
4	43	1,379
5	6	1,993
US **Total**	**191**	**1,591**

[a]Sites with any completed RODS and with ATSDR Public Health Assessments completed from FY92 to FY94 .

Table 5. Proportion of sites[a] that have completed Removal Actions.

ATSDR Public Health Category	Number of sites	Number with removal activity (as of Apr. 95)	Percent (%) of sites with removals
1	9	5	56
2	145	79	54
3	125	48	38
4	56	25	45
5	9	1	11
Total	**344**	**158**	**46%**

[a] Sites with ATSDR Public Health Assessments completed from FY92 to FY94.

Appendix B - Methods Used by OTA in This Report

To respond to this request OTA staff interviewed ATSDR and EPA staff, reviewed selected EPA Records of Decision (RODS) and ATSDR Public Health Assessments (PHAs), and analyzed data provided by EPA about dates and costs of activities at NPL sites. Specifically,

.OTA interviewed ATSDR staff including their Assistant Administrator, Director level personnel, and others. OTA also interviewed staff at the EPA Office of Emergency and Remedial Response (Superfund), Hazardous Site Evaluation Division including their Director, Assistant Director level personnel, and others. These same people were given the opportunity to comment on draft forms of this report.

.OTA made a preliminary review of data provided by ATSDR and EPA on all 369 NPL and non NPL sites with Public Health Assessments released from FY92 through FY94. As an example, one possible measure of EPA' s priority setting may be the speed with which EPA has issued a ROD compared to ATSDR's categorization of public health concern.

.OTA staff reviewed 40 EPA Records of Decision (RODS) for 32 NPL sites. These sites were selected at random from among the216 sites that have both PHAs and RODS. This sample was used to compare the proposed remedial costs of cleanup for sites with high ATSDR public health categories (Public Health Categories 1 and 2) to the costs for lower category sites (Public Health Categories 4 and 5). OTA also looked at the extent to which EPA based its cleanup decisions on future versus current risks and exposures. RODS provided OTA with a summary of EPA's analysis of the characteristics of a NPL site and the logic and justification used in making cleanup decisions.[11]

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[11] Even in cases where the ROD was completed before the ATSDR report was available, both agencies are looking at the same original site data A typical ROD includes a summary of information gathered during the RI phase, and a description of the risk assessment process used including identification of key pollutants, various exposure scenarios examined, risks (in terms of probability of excess cancers per person exposed), an analysis of the current human exposures and population-at-risk, and an analysis of future or potential human exposures.

Table B. EPA Records of Decision (RODS) reviewed in this study for cleanup strategy and cost data, sorted by EPA Region and ATSDR Public Health Category (in parenthesis).

Sites with RODS and 1992 ATSDR Public Health Assessments

	Sites with ATSDR Public Health Category (1 or 2)	Sites with ATSDR Public Health Category (4 or 5)
Region 1	Tibbetts Road (2)	Wells G&H (4)
Region 2	Curcio Scrap Metal (1)	Preferred Plating Corp (5)
	Circuitron (2)	Solvent Savers (4)
Region 3	Woodlawn Co Landfill (2)	McAdoo Associates (5)
	Cryo-chem (2)	Avco Lycoming-Williamsport Divis (4)
Region 4	White House Waste Oil Pits (2)	City Industries (4)
Region 5	LaSalle Elec Utils (2)	Ft. Wayne Reduction Dump (5)
	Muskego San Landfill (2)	Hagen Farm (5)
	South Macomb Disposal Authority (2)	J and L Landfill (4)
	Acme Solvent Reclaiming Inc (2)	Reilly Tar and Chem St Louis Park (4)
	Oconomowoc Electroplating Co (2)	Grand Traverse Overall Supply (5)
Region 7	Midwest Manufacturing/North Fa (2)	Wheeling Disposal Service Co, Inc (4)
Region 9	Westinghouse Sunnyvale Plant (2)	Sola Optical USA Inc (4)

Sites with RODS and 1993/94 ATSDR Public Health Assessments

	Sites with ATSDR Public Health Category (1 or 2)	Sites with ATSDR Public Health Category (4 or 5)
Region 2	Johnstown City LF (2) both	Frontera Creek (5) both
Region 5	Waite Park Wells (2)	American Anodco (4)
Region 10	American Crossarm and Conduit Co (2)	Fort Lewis Landfill No 5 (4)

- OTA staff reviewed and compared the evaluation of site risks presented in

10 ATSDR Public Health Assessments with the corresponding description of health risks presented in the EPA RODS. We focused on sites that had been given ATSDR's highest and lowest PHC categories of 1 and 5, respectively. Throughout its analysis OTA considered the ATSDR PHA as the public health "gold standard" against which to measure EPA's decisions about a specific site, as revealed in the corresponding ROD for that site.

•OTA analyzed data from the EPA Office of Emergency and Remedial Response (Superfund) including the following NPL site variables: 1. timing and costs of any Removal Actions, 2. timing and costs of Remedial Investigation (RI) and Feasibility Study, 3. cost of the Preferred Remedy, and 4. site lead, i.e., PRP versus EPA lead site.